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The Muscle Shoals Project—What It Is, Where It Is and Why It Is

LOCATED in Northwestern Alabama, on the Tennessee River a Few Miles From the Tennessee State Line, It Has Cost the Government About $105,000,000—Nitrate and Hydro-Electric Plants as a War Measure—The Great Wilson Dam, About 30 Per Cent Completed—Towns in Vicinity Are Having Big Real Estate Boom—Rich Phosphate Deposits in Tennessee Are Nearby, While There Are Great Coal and Iron Mines in the Vicinity—Engineers Claim 1,000,000 Horsepower Can Be Developed With Fall of 135 Feet in Thirty-five Miles of Tennessee River.

BY JAMES MARTIN MILLER.

"IS that Washington?" was a voice heard by central the other day over the telephone wires from Detroit.

"I want to talk with Uncle Sam. Don't be so long, central," was heard.

"Who wants Uncle Sam?" demanded the War Department central.

"Henry Ford," came the answer.

"Oh, Henry Ford; right away, Mr. Ford; glad to serve you," said central.

Henry Ford speaking. That you Uncle Sam."

"Yes, Henry, it is I, but you had better take the first train for Washington for we can't talk about that Muscles Shoals proposition over the 'phone very well, besides I think I'm ready to say something to you about your offer," said Uncle Sam.

And Mr. Ford responded to Uncle Sam's call by appearing in Washington a few days ago.

Secretary of War Weeks became master of ceremonies in receiving Mr. Ford. After a handshake between Uncle Sam and Mr. Ford both sat down as if they were tackling the Muscle Shoals business at once, just like hard-headed business men. But Ford digressed a little with a look of quaint humor in his eye, by saying:

"Uncle Sam, I want to tell you a little story, or rather it is a conundrum," with your kind permission."

"When a bachelor marries a widow named Elizabeth with two children what has he got?"

"Give it up," said Uncle Sam, smiling.

"Why," said Henry, "he got a Lizzie and two runabouts."

Uncle Sam laughed and said:

"I see, Henry, that you measure everything in the terms of the 'Tin Lizzie.'

"Yes," said Ford, "that may be, and I'm down here to help you out of the awful financial hole you are in at Muscle Shoals. You put millions upon millions of dollars into the Muscle Shoals proposition. You partly built the Wilson dam across the Tennessee river, in northern Alabama, almost at the southern boundary of Tennessee. You also covered 3,900 acres of ground with partly constructed buildings of a hydro-electric plant and two enormous nitrate plants, plants No. 1 and No. 2. It is a useless pile of junk in the present state. This enormous pile is going to waste fast, Uncle Sam, and besides it is costing you $500,000 a year to watch the idle pile and take care of it the best you can."

"Yes, what you say is too true and sometimes I feel that I will break down with nervous prostration thinking of the investments I have made during the past six years. But that is what war drove us into. These proposed great power and nitrate plants were much needed had the war continued," said Uncle Sam.

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"SOME people, Henry, you know, say that I am an impressionable old man, easily influenced and led into making bad investments. They say these things after the war is over, but these same people before the war shouted 'preparedness' from the housetops, you remember. And so I prepared. My Muscle Shoals is simply another example of the waste of war. Some people say I get into very bad company when I associate with the democrats and listen to what they say and advise. Then some others tell me that the republicans are a lot of rascals and will get me in bad if I associate with them. So, Henry, to tell you the truth, I don't know what to do sometimes. I confess that I get badly mixed. I have both of these parties to deal with and in addition to them the socialist party, the prohibition party, and now I have the women's party on my hands. They are all after me all the time, telling me what to do and what not to do.

"Even your Uncle Sam had a mother, Henry, so I am obliged to listen nowadays to the ladies. I'll admit they sort o' make me dizzy sometimes. But I have to listen. I simply sit mute and take my medicine."

"But, Uncle Sam, you have a lot of rich relations who will get you out of this wasteful Muscle Shoals investment. They will stand by you to the finish and enable you to 'save face,' as the Chinaman puts it," said Henry Ford.

"Oh, some of my rich relations are kind, but really I think I can place more dependence in my poor relations; they have stood by me through thick and thin. These poor relations of mine are the salt of the earth. It is true that some of them become a little unreasonable at times and get absurd notions into their heads and are apt to credit silly rumors that pass from mouth to mouth and sound like and is parrot talk. I wish my rich relations and my poor relations would get together and have a better understanding of each other. But I've seen encouraging indications lately that they are understanding each other better, Henry.

"Now, I think they are going to stand by me in the Muscle Shoals enterprises. I am convinced that we can make of that power plant, together with the nitrate plant, one of the most productive institutions.

"My nitrate plants at Muscle Shoals, including the hydro-electric plant, has cost me up to June 30, 1920," continued Uncle Sam, the sum of $87,951,977. The Wilson dam, or dam No. 2, has cost me the round sum of $17,000,000. This Wilson dam is about 30 per cent completed. I see from the report of your engineers, Henry, that you will complete the dam, which means that 70 per cent of it is to be completed, for $23,000,000. I'll admit that this, on the face of it, seems to be much cheaper than my own War Department engineers did 30 per cent of the work for. To fully complete dams No. 2 and No. 3, including the the $17,000,000 already spent by me, makes the total cost that will have been spent for dams, $40,000,000. This makes the total cost for the nitrate plats and dams $129,951,977. This seems to be about what the Muscle Shoals enterprises will cost.

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"NOW, Henry, I want to be perfectly frank with you. Your idea of issuing money against the assets represented in the Muscle Shoals property doesn't exactly appeal to me. Of course, bonds would have to bear interest and, as you say, the government would not have to pay interest if I just start my printing presses turning out money with which to pay the some $23,000,000, more or less, that is required to finish up the Muscle Shoals proposition and put it in working order. All I'll have to do is to put my name on this money. But I say no.

"True, it puts that much more money in circulation and redeems this enormous plant to usefulness, that will, unless it is completed, be worse than a 'dead horse,' for you can bury the 'dead horse' and he is no more expense. But I'll have to protect and care for this property at a cost to me of $500,000 a year, as I said a while ago. Besides, it blocks navigation in the upper Tennessee, and I'll simply have to remove this obstruction, if nothing more than to let boats up the river.

"Henry, I feel a bit finicky about tampering with my money. Neither my rich relations nor my poor ones would want to see our money depreciate. Your scheme might not have that effect of itself, but it would establish a bad precedent and might tend to cheapen our money if carried on after we got started once. The principle is wrong.

"I wonder sometimes, however, if our dearest money in the world is not giving those countries with cheap money a great advantage over us. The European countries can't afford to buy dollars with which to buy American corn, wheat, cotton and our manufactured products. Our export trade is at a very low ebb. We need to sell our goods in foreign countries for our complete prosperity.

"Millions of tons of phosphate have been shipped from the Florida phosphate fields, as well as from the exceedingly rich phosphate deposits of southern Tennessee, adjacent to Muscle Shoals. Before the war most of this valuable fertilizer went to France, Germany and other countries. We did not appreciate the value of our rich phosphate fields. The supply of phosphate adjacent to Muscle Shoals is almost inexhaustible. It is from this that the fertilizers will be made. The Tennessee river is navigable to Muscle Shoals. Boats now navigate this big river below the dam. This makes cheap transportation," continued Uncle Sam, concluding the conversation.

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IN 1918 this country purchased $70,000,000 worth of nitrate from Chile and in 1919, $68,229,548 worth. There is an export duty paid to Chile for the nitrate brought out of that country. In 1918 we paid Chile $20,135,960 in export duties on the nitrate brought to the United States. In 1914 and other years before the war we brought from Chile $20,000,000 worth a year and somewhat less some years. But we are constant users of nitrate and should use more. It is expected of those most interested in Muscle Shoals, in the broad way as a help to our agricultural welfare, that we will not need to bring any nitrate from Chile if the great dams and water power, with the nitrate production plants, are completed and utilized at Muscle Shoals. These plants need only slight changes so as to make fertilizer.

The American Farm Bureau Federation, with an office in Washington, reports that a strong fight is being made against the Muscle Shoals development by the fertilizer trust. They also claim that big British interests that are interested in the nitrate deposits in Chile are fighting the Muscle Shoals proposition with the "unseen hand." Government officials have intimated to the writer that some of the propositions made to lease and operate the Muscle Shoals water power and nitrate plants are not made in good faith, but only with a view to bottling these enterprises up and to throttle competition.

One man of very great resources has an offer under consideration by the War Department that will undoubtedly be put up to Congress, with at least two other offers to lease the Muscle Shoals plants, within a very short time. The particular one mentioned is looked upon as an offer in good faith and it is the strong belief that there is no "nigger in the wood pile" in this proposition.

One representative, opposing the the Muscle Shoals project, explains his stand, as follows:

"The Muscle Shoals plant is not a fertilizer plants, but a high explosive plant. It cannot produce fertilizer without extensive and expensive alterations. The plant not only cannot, as it stands, produce fertilizer to sell to the farmers, but the War Department's plan does not even contemplate the manufacture of a finished fertilizer.

"The principal product will be sulphate of ammonia, which is not a fertilizer, but a fertiliser ingredient, to be sold, not to farmers, but to fertilier manufacturers.

"The Secretary of War promised that the sulphate of ammonia produced at Muscle Shoals can be sold at $65 a ton, but sulphate of ammonia from commercial plants is now quoted at $65 a ton, and I understand that today a shrewd buyer can get all he wants at $60 a ton."

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FRANK I. MANN sent the following report to Congress on February 19, 1920. He is an expert on soil and farms, and is a brother of Representative Mann of Illinois. He says in a letter to his brother:

"Ever since I learned of the Muscle Shoals project, when in Tennessee a few years ago, I have felt quite an interest in its success, because of the great opportunity it seemed to present for an increased and economical production of crops by supplying a cheaper form of fixed nitrogen. The value of nitrogen and phosporus in the production of crops has not been properly realized. Take an example of corn, for instance: In 100 pounds of corn there are but about three and a half pounds of materials which were taken from the soil; the balance of the dry weight is made of compounds formed from carbon taken from the air by the leaves of the plants and formed into sugars, starches, oils, etc.

"The amount of these carbon compounds that can be formed is measured, however, by the amount of materials that could be secured from the soil. If the same plants which produced 100 pounds of corn could have secured another three and a half pounds of soil materials—mostly phosphorus and nitrogen—they could have formed another 100 pounds of corn, without any further effort on the part of the grower, and the yield would be increased 100 per cent. On the best corn-belt soils we find it is comparatively easy to double the yields of crops by doubling the phosphorus available to the crops, where there is sufficient nitrogen to match such an amount of phosphorus. The soils which contain such an amount of nitrogen, however, are small in area. On the early glaciated and the unglaciated soils nitrogen is in small amount and the crops will grow in proportion as they can secure nitrogen, except on the natural rich soils, which are usually alluvial and limited in extent. As a rule, the soils south of the Ohio and Missouri rivers are unglaciated and low in nitrogen, except the alluvial types. A large part of southern Illinois, Indiana, Missouri, Kansas, Iowa and Ohio is composed of soil types on which crops — other than legumes — will grow in proportion as the plants can secure nitrogen from the soil.

"This increase in yield, which comes from the proper element of fertility, increases food production without an increase in area or of man labor, and is real economic production if the cost of the fertilizing element is small.

"A good deal of the corn-belt soils have already or will soon reach a nitrogen limit to their production, and, while we will be able to profitably maintain a nitrogen supply for some time by using legume crops for the purpose, it might also be profitable and economical to supplement this legume nitrogen with a fixed commercial nitrogen. In the south, however, with the high average temperature and rainfall, it is doubtful if it would be possible to maintain enough legume nitrogen in a soil to secure a high production of food products, because of the great destruction of the organic matter in which such nitrogen must be held from the bacterial action and leaching when crops are not taking food from the soil.

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"I KNOW of no one thing which could add so much to the production of more and cheaper food, and in such an economical way, as to supply ehcap nitrogen for these lands so poor in humus. I do not know how cheaply nitrogen might be fixed at Muscle Shoals, but it would certainly be much cheaper than to secure it through legume growth. I figured out once the relative horsepower equivalent at Niagara Falls in fixing nitrogen compared to a clover field. The nitrogen fixed by an eighty-acre field of clover, under favorable conditions and a large growth, could be fixed by a twenty-eight-horsepower engine working throughout the season. If the Tennessee river can be properly harnessed it should be able to fix nitrogen at a small fraction of the cost of fixing it by means of bacterial or legume energy.

"In these days of low manpower on the farms and the need of more food economically produced, it would seem to be almost a crime against civilization to not heed this great need for cheap nitrogen.

"If there is any possible and fair way to provide that the Muscle Shoals power might be used for fixing nitrogen, and that it might be obtained cheaply for farm use, it would be a wonderful step in the production of cheaper food and help to quiet the unrest of the present and future."

Muscle Shoals is in the northwestern part of Alabama, within a few miles of the Tennessee line. It is, roughly, midway between Birmingham, Ala., and Nashville, Tenn. It is on the Tennessee river, which is navigable for 652 miles of its length. But 400 miles of the upper Tennessee is now cut off from navigation because the river is obstructed by the Wilson dam at Muscle Shoals.

Muscle Shoals is not a town. There are three towns near this place in the river called Muscle Shoals—namely, Florence, Sheffield and Tuscumbia; total population about 15,000. As is always the case, these towns anticipate the great improvements at Muscle Shoals and real estate boomers and speculators are there to tell you how to make millions by buying real estate. Prices are said to be soaring and unreasonable. No doubt, however, a big town will develop in time if the Muscle Shoals project does not die.

A special committee of the Mississippi Valley Association made the following report under date of May 28, 1921, before Henry Ford and others made their offers:

"1. That two (2) nitrate plants of large capacity, well built at great expense, and required for national defense are standing idle.

"2. That these plants can be made a profitable investment and a benefit to agriculture if cheap power were available.

"3. That this cheap power can be furnished only by the dam, now awaiting completion.

"4. That in its present condition the dam completely blocks navigation on the Tennessee river at this point.

"5. That the work done to date has been well done, but will certainly be damaged if abandoned in its present condition.

"6. That additional delay means only a constantly increasing loss to the government.

"7. That a relatively small additional cost will bring to fruition a great enterprise, and add an important factor to the development of our country.

"8. That the completion of this enterprise is one of the most important factors before us at this time and in accord with the declaration of principles of our association, which calls for the development of agriculture, of industry, of finance, and of transportation.

"We therefore recommend.

"(1) The immediate appropriation of $10,000,000 to enable the construction of the dam to be resumed.

"(2) In view of the fact that the government cannot transfer its right to manufacture nitrate by the cyanamid process to others than the patentee, a government-controlled corporation or corporations should be established to operate both the hydro-electric power and the nitrate plants, preference being given to agriculture, but always reserving the right to resume control and operation in event of war."

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THE War Department has received many irresponsible and freak letters since this Muscle Shoals agitation started. One individual wrote the government that if it would pay him $1,000,000 a year in advance for five years he would put the dams and nitrate plants in "apple pie" order.

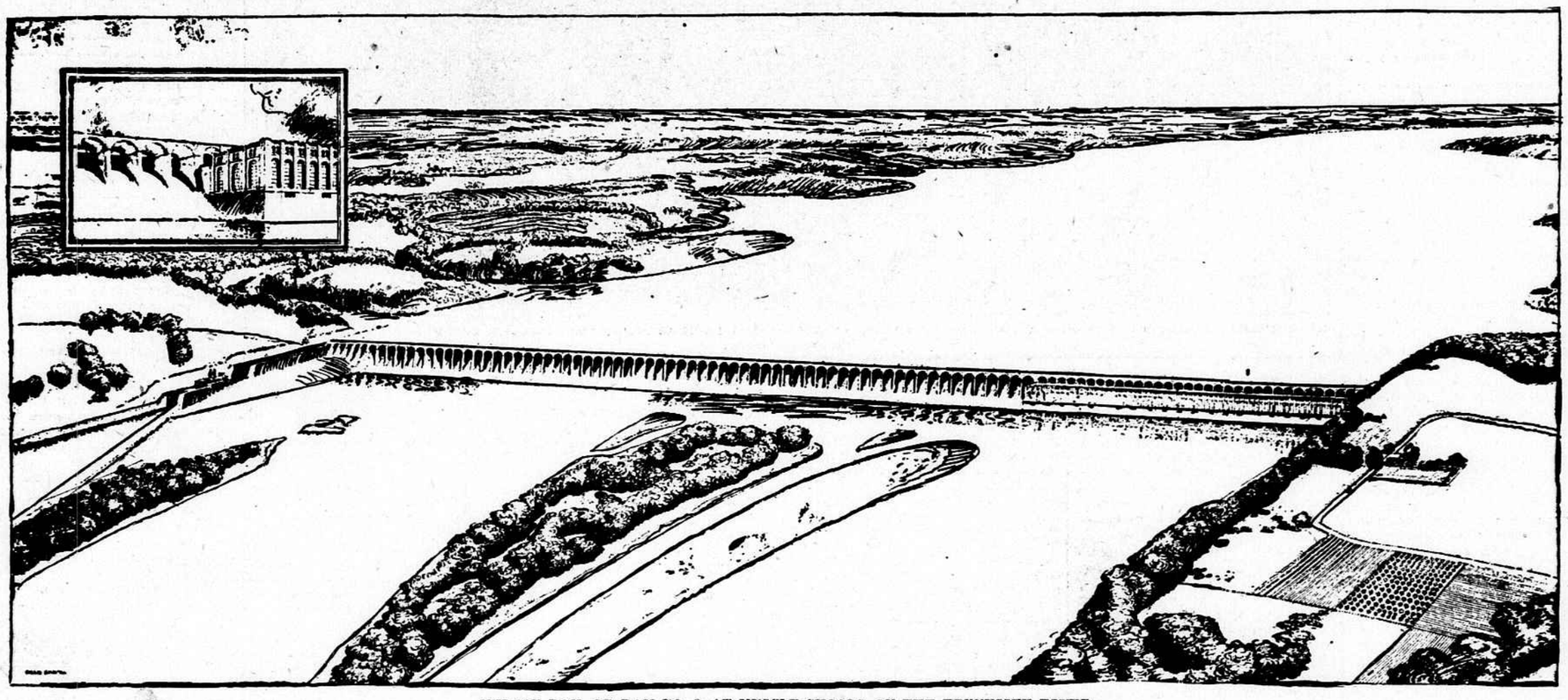
Mr. Ford has received several hundred letters with propositions. One man wrote him that he had discovered a process for making nitrate out of which he would guarantee that $1,000,000 a year could be made. "But," said he, "I will sell you the right for $50,000 cash."

A summary of Henry Ford's proposition to the government follows:

The government must complete the Wilson dam as speedily as possible and install hydro-electric facilities and equipment for generating 600,000 horsepower, then Mr. Ford's company will agree to lease the dam, power plant and all property connected with them for 100 years. The company will pay to the United States 6 per cent on the remaining cost of locks, the dam and power house taken at $20,000,000 in payments of $1,200,000, except during the first six years of the lease period payments shall begin and be made annually as follows: $200,000 one year from date, and thereafter $200,000 annually at the end of each year for the period of five years.

After the first six years payment of $1,200,000 shall be made annually at the end of each calendar year, during the lease period. The company will also pay the government $35,000 a year for repairs, maintenance and operation of the dam, gates and locks at Wilson dam for the 100 years. It will also pay a sinking fund of $39,537 a year for ninety-four years, the sinking fun investments to bear the highest rate of interest obtainable, but not less than 4 per cent per annum.

Mr. Ford also agrees to buy nitrate plant No. 2 for $5,000,000. In order that the farmers may have the fertilizer produced without paying excessive profits he guarantees that his net profits shall not exceed more than 8 per cent. He proposes that farmers' organizations shall have representatives (two) on the board with two representatives of the company. In a word, they are to see to it that no more than 8 per cent profit is made. Mr. Ford being a quantity production man, his friends believe that he will manufacture fertilizer from the unlimited phosphate deposits in Tennessee very near Muscle Shoals in such a large volume that it will give them their supply of fertilizer at a very reasonable price.



WILSON DAM, OR DAM NO. 2, AT MUSCLE SHOALS, ON THE TENNESSEE RIVER.

MUSCLE SHOALS CANAL AT LEFT OF RAILWAY. THIS WAS COMPLETED IN 1890 AT A COST OF $3,500,000, BUT IT PROVED INADEQUATE AND INEFFICIENT. THE CANAL WILL BE SUBMERGED BY THE NEW DAMS OF MUSCLE SHOALS, AND WATER OVER THE RAILWAY TRACK WILL BE EIGHTY FEET DEEP. PHOTO TAKEN FIVE MILES ABOVE THE WILSON DAM.

LOCK, NO. 6, OF MUSCLE SHOALS CANAL. THIS WILL BE COMPLETELY SUBMERGED BY BACKWATER WHEN THE GREAT WILSON DAM IS COMPLETED.

Charting the Air.

EXPECTATION of established and well used lines of air travel between Europe and the United States has grown into certainty in the minds of governmental scientists who are working on its problems. Several federal departments are co-operating in an effort to make the air safer for daily overseas trade and passenger traffic, which they believe to be nearer than the public supposes. For this development the meteorological experts of the weather bureau, together with those of the Army and Navy, are experimenting and preparing.

Some interesting things are being done. Preparations are afoot to extend the forecasts now made as to overland air conditions and to include those above the Atlantic by means of complete outfits of instruments, pilot balloons and other apparatus to be carried on ships of commerce as well as those of war and the revenue service. Regular observations along the ocean lanes then would furnish data from which predictions could be made of storms and wind conditions between New York and London, just as they are now supplied to the aerial mail service and all aviators throughout the eastern half of the United States of overland conditions. This new information would be so inherently related to land observations that a study of it could hardly fail to increase the accuracy of the weather forecasts which are now so familiar. No flier thinks of leaving earth without consulting the recently begun forecasts of conditions in the upper air. The results of the "soundings," as the deductions from the flights of pilot balloons are termed, have been found invaluable in indicating what the immediate future free-air conditions over the land will be.

Without the pilot balloons it would have been impossible, owing to the inaccuracy of barometric reports, to have foretold what wind conditions were to be experienced in the first transatlantic flight made by NC-4 from Halifax to Horta. They have proved their value so completely that twenty-three stations, at which they are used every day, dot the country east of a line drawn north and south through central Nebraska and soon may extend over the whole country. A number of these balloon stations are being set up at other points on account of the increased use of the hydroplane.